

THE IMPACT OF CLOSE FRIENDS' ACADEMIC ORIENTATION AND
DEVIANCY ON ACADEMIC ACHIEVEMENT, ENGAGEMENT, AND
COMPETENCE ACROSS THE MIDDLE SCHOOL TRANSITION

A Dissertation

by

NICOLE ESTELLE DYER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2010

Major Subject: School Psychology

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Approved by:

Chair of Committee,	Jan Hughes
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ABSTRACT

The Impact of Close Friends' Academic Orientation and Deviancy on Academic Achievement, Engagement, and Competence across the Middle School Transition.

(August 2010)

Nicole Estelle Dyer, B.S., Denison University

Chair of Advisory Committee: Dr. Jan Hughes

Transition to middle school is a turbulent time of development in which friends have growing impact on adolescents' academic adjustment. Structural equation modeling was used to examine the unique and joint contributions of academically oriented and deviant close friends on reading and math achievement, competence beliefs in reading and math, and engagement during the transition into middle school. The sample was 652 (53.4% male) ethnically diverse and academically at-risk students.

Within-wave associations between peer affiliation and outcome variables were found in the expected directions. Outcome variables were highly stable. The model yielded adequate fit of the data. Contrary to expectations, neither peer affiliation variable (academically-oriented friends or deviant friends) contributed to year 6 outcomes, controlling for year 5 outcomes, nor did the two affiliation variables interact in predicting changes in outcomes. Affiliation with close friends was moderately stable over time and affiliation with learning oriented friends was positively associated with the

academic outcomes and affiliation with deviant friends was negatively associated with the academic outcomes.

Close friendships may change so rapidly that a relationship between close friend affiliation at any one point in time is not predictive of changes in one's engagement, competence beliefs, or achievement. Future research that examines peer relationships and academic competencies across a longer period of time and more frequently may allow for a clearer understanding of relationships among peer affiliation and academic outcomes.

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Hughes, and my committee members, Dr. Joshi, Dr. Liew, and Dr. Willson, for their guidance and support throughout the course of this research.

I would also like to thank my friends, colleagues, and the department faculty and staff for sharing their knowledge and supporting me throughout my time at Texas A&M University. It was a great experience. I also want to extend my gratitude to the National Education Foundation, which provided the survey instrument, and to all the Texas elementary teachers and students who were willing to participate in the study.

Finally, I would like to thank my family and friends for all of their encouragement and support.

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CHAPTER I

INTRODUCTION: THE IMPORTANCE OF RESEARCH

Academic success is of critical importance to children's and adolescents' positive development and adjustment in school. Adolescents' achievement and behaviors in school have long-term consequences on their adjustment in adulthood, including adult educational attainment and employment (Melby, Conger, Fang, Wickrama, & Conger, 2008; Ou, Merskey, Reynolds, & Kohler, 2007). Many factors impact children's and adolescents' academic success and adjustment, including family contextual risk variables such as environmental adversity, family income, and neighborhood safety (Ackerman, Brown, & Izard, 2004; Bowen, Rose, Powers, & Glennie, 2008), the quality of school instruction (Wentzel & Wigfield, 1998), and educational experiences such as grade retention (Martin, 2009). The current study will focus on peer relationships, which also are known to influence youth's academic success and adjustment (for reviews, see Berndt, 1999; Engerman & Bailey, 2006).

Peer influences on achievement may be particularly important for students during middle school. For example, Cook, Deng, and Morgano (2007) examined the characteristics of middle school students' friends, and found friends' grade point average predicted student test scores. Furthermore, among several variables measuring

This dissertation follows the style of *Child Development*.

characteristics of students' friends such as absences from school, drug use, self-efficacy, and math grades, friends' grade point average had the greatest overall impact on students' behavior, including their social behavior and performance in school. An increased role for peer influence at the transition from elementary school into middle school may be due, in part, to the fact that the transition is a critical period in early adolescence characterized by multiple changes. Across this time, students experience greater psychological distress (Chung, Elias, & Schneider, 1998), and decreases have been found in academic achievement (Chung, Elias, & Schneider, 1998), academic competence (Cantin & Boivin, 2004), achievement motivation, and sense of school belonging (Schneider, Tomada, Normand, Tonci, & de Domini, 2008; Zeedyk, Gallacher, Henderson, Hope, Husband, & Lindsay, 2003). The educational outcomes of students at-risk may be more likely to be influenced by the transition to middle school. For example, youth who experienced family problems, such as divorce or financial problems, during the same year as the transition into middle school reported increased association with deviant peers, greater levels of aggression, and increases in antisocial behavior, relative to youth who did not experience family problems during the time of transition (Barber & Olsen, 2004). Also, risk factors such as poverty, neighborhood safety, and contextual family risk, were found to have a negative influence on students' academic competence (Ackerman, Brown, & Izard, 2004), academic performance (Bowen, Rose, Powers, & Glennie, 2008), as well as affiliation with deviant peers and behavior problems during middle school (Loukas, Prelow, Suizzo, & Allua, 2008).

The Transition to Middle School

Middle school is a period of rapid development marked by biological, cognitive, and emotional changes. Typically, in US schools, the transition from elementary school and into middle school occurs from grade 5 to grade 6. The time of the transition from elementary to middle school occurs during the same period as youth enter puberty, which is approximately 9 years of age (US Department of Health and Human Services, 2008). After entering middle school, many youth exhibit decreases in academic self-concept, intrinsic motivation, and grades in school (Zanobini & Usai, 2002). In addition to biological, cognitive, and emotional changes associated with puberty, the transition to middle school is often marked by changes in the school environment. Changes in the structural and organizational environment of middle school include a larger school building, a greater number of students, larger class sizes, and departmentalized teaching, which cause students to change teachers, classrooms, and classmates for each school subject throughout the day (Eccles, et al., 1993). These changes create a more impersonal environment characterized by flux, in which it is more difficult for adolescents to develop meaningful relationships with teachers and peers.

The normative decline in academic and motivational outcomes at the transition to middle school may be due a lack of fit between early adolescents' developmental needs and the middle school environment (Eccles, et al., 1993). Although early adolescence is a time when students seek independence, they experience fewer opportunities to participate in classroom decision-making, and increased control and discipline is used by teachers in the classroom than when in elementary school. For example, students in

their first year of middle school rated teachers as being less friendly, less supportive, and less caring than their teachers were in elementary school (Midgley, Feldlaufer, & Eccles, 1988).

The structural and organizational changes influence the classroom environment and students' achievement motivation and competence. Middle school students experience shifts in the classroom environment at the time of transition that include greater academic expectations, whole class task organization, and a greater emphasis on competition through ability grouping, social comparison, and public evaluation (Eccles, et al., 1996; Felner, et al., 2001). These environmental shifts may have a negative impact on students' achievement and motivation in school because they coincide with a time when early adolescents are more self-conscious and have a greater concern for their status in relation to their peers.

Across this developmental period, adolescents spend less time with parents, and report more positive interactions with peers (Larson & Richards, 1991). During early adolescence, youth increasingly become individuated from parents, as peers increase in importance and youth seek greater autonomy from parents. For example, in early adolescence, youth report receiving less support from parents and having more conflict with parents than they did during late childhood (Furman & Buhrmester, 1992). In a study of economically disadvantaged, inner city youth, middle school students spent an extensive amount of time unsupervised by adults and engaging in unstructured activities with peers (Shann, 2001). Additionally, adolescents begin to rely more on their peers for support and to help make decisions. For example, middle school students' decisions

about a dilemma were more similar to their friends' decisions after discussing the dilemma with their close friend (Berndt, Laychack, & Park, 1990). In summary, early adolescence is a period of heightened susceptibility to peer influence due to a greater desire to establish independence from parents, increased time spent with peers, shifts in the school environment, as well as shifts in the relative importance adolescents place on parents' and peers' opinions.

Additionally, as youth become more socially conscious in early adolescence, they are exposed to a larger, more diverse peer ecology. Shifts in the way the school environment is structured during middle school allow youth to interact with wide variety of peers, and peer group size increases once students enter middle school (Cairns, Xie, & Leung, 1998). During this time, early adolescents have greater control and more options regarding with whom they affiliate and spend time.

Based on the importance of the transition to middle school for future academic and social trajectories and changes in peer ecology and the importance of peers on development, researchers have studied the role of peers (i. e., having friends versus not having friends, friendship quality, and relationships with peers) during early adolescence on a variety of developmental outcomes, which include social competence, self-esteem, loneliness, academic achievement, and behavior in school (for reviews, see Gifford-Smith & Brownwell, 2003; Hartup & Stevens, 1997; Parker & Asher, 1993). Because youth encounter so many developmental and environmental changes during middle school, it is particularly important to examine the role friends play and the ways in

which friends may influence students' ability to reach academic success while making the transition into middle school.

Peers Are Agents of Socialization

Peers are significant socialization agents in students' lives. First, evidence of the effects of peer socialization on school adjustment will be discussed and will be followed by a review of the processes by which students are socialized by peers. Peer influence can lead to both positive and negative outcomes in students' lives. Much research has focused on the negative outcomes of peer relationships. This research finds that close friends influence adolescent risk and problem behavior (Fuligni, Eccles, Barber, & Clements, 2001; Jaccard, Blanton, & Dodge, 2005; Reitz, Dekovic, Meijer, & Engels, 2006). Association with deviant friends in early adolescence is associated with increases in deviant behavior such as alcohol and tobacco use (DuBois & Silverthorn, 2004), aggression (Simmons-Morton, Hartos, & Haynie, 2004), sexual activity and binge drinking (Jaccard et al., 2005). Affiliation with deviant close friends is also associated with negative academic outcomes, such as lower levels of engagement in school (Simmons-Morton et al.). For example, adolescents with a greater proportion of friends whom drink alcohol regularly, use drugs, and skip class perform more poorly in school than other adolescents (Fuligni et al., 2001).

Just as peers can influence students in negative ways, peers also have a positive impact on students' lives. In a study of the outcomes of high school students' extracurricular involvement, greater association with prosocial friends explained the positive benefit of students' participation in extracurricular activities. Particularly,

students with prosocial friends exhibited increased engagement in school and lower levels of depression than students participating in extracurricular activities who did not associate with a prosocial peer group (Fredricks & Eccles, 2005). Of particular interest is the positive effect peers may have on achievement and related variables. In the middle school years, peers influence students' prosocial behavior and goal pursuit (Wentzel, 1998; Wentzel, Barry, & Caldwell, 2004). For example, friends' prosocial behavior influenced 6th grade students' future prosocial behavior through changes in students' prosocial goal pursuit (Wentzel, et al., 2004). In the school environment, peers act as a normative and comparative reference group which influences achievement (Guldemon & Meijnen, 2000). Relationships with peers and peer groups may promote academic engagement, motivation, competence, and achievement in secondary school (for reviews, see Ryan, 2000; Sage & Kindermann, 1999; Wentzel & Watkins, 2002). For example, Altermatt and Pomerantz (2003) examined the academic competence and motivational beliefs of early adolescents and their friends across two school years. Controlling for students' prior academic performance, friends' achievement predicted early adolescents' report card grades and friends' beliefs predicted the importance early adolescents' place on meeting academic standards, and their attributions for success and failure.

Methods of Peer Socialization

Research has drawn on several different theoretical perspectives to explain the means by which peers exert socializing effects. Social learning theory suggests direct socialization occurs by the peer group, which acts to shape behavior through modeling,

observation, and reinforcement (Bandura, 1977; Sage & Kinderman, 1999; Schunk & Zimmerman, 1997). One example of peers acting as agents of socialization through reinforcement is called deviancy training. Deviancy training is a process by which peer dyads become more similar over time by reinforcing behavior through laughter and showing approval in conversation (Dishion, Spracklen, Andrews, & Patterson, 1996). Specifically, in deviant friend dyads, friends positively reinforced deviant conversations and the reinforcement of deviant topics predicted adolescent deviant behavior two years later. The opposite was true for friend dyads composed of nondelinquent friends. Through peer group affiliation, youth learn social and behavioral contingencies. Interactions with peers reinforce and shape youth behavior based on peer group contingencies (Berndt & Keefe, 1995).

A second theoretical perspective, which suggests peers influence student beliefs and behaviors indirectly through group norms and social comparison, is reference group theory. Reference group theory posits that group influence occurs through two processes: internalization of group norms and social comparison (Kelly, 1952, as cited in Guldemon & Meijnen, 2000). First, students learn about group norms, attitudes, and beliefs from the peer group, which is both a normative reference group from whom students learn normative beliefs, as well as a comparative reference group, to whom students compare themselves and make judgments (Guldemon & Meijnen, 2000). Students develop their own values and beliefs by identifying with and internalizing group norms (Ennett & Bauman, 1994). The person-similarity model states that peer group norms influence behaviors through acceptance and evaluation. For example, in

classroom environments comprised of much aggression, aggressive behavior is normative and accepted by peers (Stormshak, Bierman, Bruschi, Dodge, Coie, & the Conduct Problem Prevention Research Group, 1999); thus, students are more likely to be aggressive. In such classrooms, students indirectly are socialized to develop aggressive behavior because aggression is normative for the group. Next, peers influence student beliefs and behaviors indirectly through social comparison. Social comparison is a process by which students compare themselves to their peers. Peers in the classroom are an important group during childhood and early adolescence. The frame of reference hypothesis suggests peers in the classroom serve as a reference group to whom students compare themselves (Guldemond & Meijnen, 2000). Through social comparison, students develop academic competence beliefs based on comparing oneself to one's peers and determining if one's own behavior is appropriate (Marsh & Parker, 1984; Maxwell, 2002).

Self-determination theory is a third theoretical perspective, which may explain the process through which youth are socialized by their peers. In self-determination theory, motivation is influenced by the extent by which an individual's basic needs of autonomy, competence, and relatedness are met (Ryan & Deci, 2000). Peers impact youth achievement motivation through fulfillment of youth's need for belonging and acceptance. In a study that examined the relationship between affiliation with deviant friends and achievement, Veronneau, Vitaro, Pedersen, and Tremblay (2008) found that friendships with aggressive and/or disruptive peers predicted lower levels of school commitment and academic achievement. Aggressive and/or disruptive youth in this

study fulfilled their need of relatedness by developing relationships with deviant friends, which in turn, negatively influence achievement and commitment to school. Another study examining self-determination theory found high school students who received inadequate social support from peers had lower levels of academic motivation as well as decreased academic achievement and self-esteem, and increased problematic academic behaviors and intentions to drop out of school (Legault, Green-Demers, & Pelletier, 2006).

Relationships with Friends

As students enter into middle school and friendship is increasingly important, they enter into various types of peer relationships, which impact school performance and adjustment. Three dimensions of peer relatedness important to students' adjustment will be discussed: peer acceptance, peer group affiliation, and friendship. Students may affiliate with groups of peers or may develop more close relationships with friends.

Peer acceptance. Being accepted and liked by one's peers is an element important to positive growth and adaptation throughout youth's lives. Peer liking is assessed through nomination procedures, in which peers name youth whom they like "the most" or "the least", and rating procedures, in which youth rate peers with respect to their degree of liking (Asher & Dodge, 1986; Chan, & Mpofu, 2001; Coie, Dodge, & Coppotelli, 1982). Peer liking and acceptance determines a youth's social status, which has implications on future development and outcomes in school. For example, youth who are rated as being liked least by many peers and who receive few ratings as liked most have a rejected social status. Rejected youth tend to be more aggressive, disruptive,

and isolated than accepted peers (Ladd, 1999), although the association between rejected status and aggression may differ in contexts that differ in normative levels of aggression (Stormshak, et al., 1999). Peer rejection in kindergarten predicted changes in school engagement and achievement in 3rd and 5th grades, such that peer rejection led to reduced school engagement, which subsequently led to reduced achievement (Buhs, Ladd, & Herald, 2006). Well-liked and accepted youth receive positive emotional support from peers. Being well-liked by many peers, which is also referred to as being popular, in early adolescence has been linked to adaptive development. For example, popularity in middle school was linked to positive adjustment, and popular middle school students were more susceptible to socialization by the peer group, such that popularity predicted an increase in behaviors that were approved by the broader peer group, and a decrease in behaviors that were not well accepted by the broader peer group (Allen, Porter, McFarland, Marsh, & McElhaney, 2005).

Peer group. A child may have different peer groups in different settings (e.g., school, community organizations, church, neighborhood). The most frequently studied peer group is one's school peer group, which is comprised of the classmates with whom youth go to school. Within the broader school peer group, students tend to affiliate or associate with specific groups of peers at school. The composition of the school peer group impacts students' school adjustment. For example, in early adolescence, peer groups can be differentiated by and are composed of students with similar levels of academic achievement (Chen, Chang, & He, 2003), classroom belonging (Hamm, & Faircloth, 2005), and achievement motivation (Kinderman, 1993; Sage & Kinderman,

1999). Youth's affiliation with such peer groups acts to influence student behavior. Affiliation with a peer group during the school year predicts adolescent's end-of-year achievement (Nichols & White, 2001; Ryan, 2001), as well as in changes across the school year in students' engagement (Kindermann), and interest and enjoyment in school (Ryan, 2001). Also, characteristics of the peer group with whom youth affiliate have been found to be associated with students' behavior. For example, affiliation with learning oriented peers in 10th grade predicts high school students' academic achievement in the same year (Stewart, 2008) as well as in 12th grade, when controlling for ethnicity, (Engerman & Bailey, 2006). Just as prosocial peer groups influence students, so do peer groups comprised of deviant peers. Affiliation with risky peers in early adolescence leads to serious delinquency (Ingram, Patchin, Huebner, McCluskey, & Bynum, 2007) and substance abuse (DuBois & Silverthorn, 2004; Suldo, Mihalas, Powell, & French, 2008; Yan, Beck, Howard, Shattuck, & Kerr, 2008). For example, after controlling for previous risky and deviant behavior, middle school youth who associate with deviant peers and have an orientation toward following peers' risky behavior in order to fit in with the peer group, are more likely to engage in risky and deviant behavior, such as substance use, sexual activity, school problem behavior, aggression, and police involvement, when in high school (Goldstein, Davis-Kean, & Eccles, 2005).

Friends and close friends. Friends are those peers with whom youth affiliate and spend time and to whom youth feel close. Close friends are those friends to whom youth feel a significant emotional bond and with whom youth may spend greater time.

Friendship quality and quantity are factors that impact positive adjustment in children and adolescents. Students with high-quality and stable friends positively adjust to middle school (Berndt, Hawkins, & Jiao, 1999). Also, friendship quantity is associated with more positive adjustment to school, such as positive perceptions of school, school liking, and performance in school (Ladd, 1990). Friends tend to share similar values, beliefs, behaviors, characteristics, and interests (Berndt & Murphy, 2002). Such similarities between friends may be explained by both selection and socialization processes.

Selection processes refer to the fact that children and adolescents often select peers similar to themselves with whom they develop friendships (Light & Dishion, 2007).

Socialization is seen as processes of influence in which friends' characteristics and behaviors become more similar over time. For example, after controlling for similarity between friends, affiliation with antisocial peers led to increases in antisocial behavior in adolescents, such that friends became more similar over time due to processes of socialization (Mahoney, Stattin, & Lord, 2004; Maxwell, 2002).

Although affiliations with peer groups and relationships with peers are important, relationships with close friends, relative to peers that one spends time with but does not share a close relationship, play an even more significant role in youth's lives (for a review, see Berndt, 1999). Of particular interest to the study are the relationships youth have with close friends. For the purposes of the current study, close friends were identified first, by asking youth to name peers they spend time with outside of the classroom beginning with the peers with whom they spend the most time; and then, by asking youth if a friend was a close friend or just someone they spend time with. Close

friends may have a greater influence than other friends on students' behavior (Berndt, 1999). For example, Jaccard et al. (2005) found the behavior of youth's close friends to predict changes in adolescent sexual behavior and binge drinking beyond changes predicted by a random classmate of the same sex and age. The attributes of adolescents' close friends influence student school behavior. Reciprocated very best friends were found to have a stronger influence, than non-reciprocated friends, on students' attributions for success and failure in school, and the importance students place on meeting academic standards (Altermatt & Pomerantz, 2003). Close friends' performance and academic values are related to adolescents' school performance and future achievement motivation, above prior achievement and motivation (Cook, et al., 2007; Nelson & DeBacker, 2008).

Peer Influence Across the Middle School Transition

Research examining peer influence in the areas of acceptance, the peer group, and friendship has specifically targeted peer influence across the middle school years and its impact on academic outcomes. During middle school, friendship, peer support, and acceptance influence early adolescents' adjustment to school (Berndt, Hawkins, & Jiao, 1999), achievement motivation and engagement (Patrick, Ryan, & Kaplan 2007), and prosocial goal pursuit (Wentzel, 1998). Also, acceptance by peers in the 4th grade classroom predicted students' academic competence and internalizing symptoms in 5th grade, which predicted academic performance in 6th grade (Flook, Repetti, & Ullman, 2005). Especially during the period of transition into middle school, friends are thought to have an influence on youths' school adjustment. As students enter into middle school,

they experience many changes in their relationships with peers, peer acceptance, and social support (Cantin & Boivin, 2004; Hardy, Bukowski, & Sippola, 2002; Pellegrini & Bartini, 2000). Immediately following the transition into middle school, youth have fewer mutual friendships (Hardy, et al.; Kingery & Erdley, 2007) and fewer close friendships (Pellegrini & Bartini), the size of friendship networks decreases (Cantin & Boivin), and peer acceptance is less stable during the transition period than at other times in middle school (Hardy, et al.). Peer acceptance and supportive relationships with friends during the transition to middle school are associated with academic outcomes. Specifically, supportive friendships with peers predicts positive school bonding (Schneider, et al., 2008), and peer acceptance prior to the transition predicts increases in school involvement, and decreases in loneliness immediately following the transition to middle school (Kingery & Erdley). Also, students accepted by peers after transitioning into middle school are more engaged in classroom activities and are less likely to be retained in school (Lubbers, Van Der Werf, Snijders, Creemers, & Kuyper, 2006) than are children who are less accepted by their middle school peers. Such research supports the belief that peers play a critical role in fostering positive school outcomes during students' transition from elementary grades into middle school.

Compensatory Role of Friends in Risk

Consistent with a risk and resiliency framework of adjustment (Luthar & Cicchetti, 2000; Masten, 2007), friends may play a different role in youths' lives in the context of risk. In the examination of cumulative risk and resiliency models of adaptation, friendships consisting of support and positive school influence may be

promotive factors in the context of risk (Ostaszewski & Zimmerman, 2006). In support of this reasoning, research on adolescent risk behaviors suggests that friends may play a compensatory role in adolescents' lives and protect adolescents from participating in risk behaviors (Maxwell, 2002; Reis, Colbert, & Hebert, 2005). For example, affiliation with learning-oriented peers acts to buffer against the negative consequences of a conflicted parent-child relationship (Liu, 2004). As is suggested by Liu, risk involves the relationships that adolescents experience with others, including having a deviant friend. Just as a prosocial friend can protect against negative outcomes associated with parental conflict, a prosocial friend may protect against the negative effects related to having relationships with deviant friends. Consistent with resiliency theories/research on risk and resiliency, relationships with deviant friends during early adolescence can be considered to be a context of risk. In the context of affiliation with deviant friends, affiliation with learning-oriented friends may play a stronger role. Specifically, prosocial friends may act as a buffer against the negative effects of deviant friends related to academic performance and adjustment. Currently, much research exists on prosocial or deviant friends' impact on adolescents' achievement motivation, but little is known of the combined influence of prosocial and deviant peers on academic-related variables. The current study will use risk and resiliency theory to examine the joint influence of friends' academic orientation and deviancy on learning-related variables.

Hypotheses

The examination of the effect of peer affiliation on academic-related variables across the middle school transition will focus on two aspects of one's friends: friend

status (close friends) and peer characteristics (academic orientation and deviancy). The purpose is to examine the joint contribution of the academic orientation of one's friends and having at least one deviant friend on academic outcomes (achievement, engagement, competence) across the middle school transition. The unique influences of peers' academic orientation and deviancy on academically related variables will be examined. Also, the influence of peers' academic orientation on academically related variables will be examined in the context of risk (i.e., the presence of deviant peer affiliation). The hypothesized model is shown in Figure 1. In the figure, the peer affiliation measures should be shown one on top of the other, as they were assessed at the same time.

Affiliation with academically oriented close friends is expected to positively relate to academic achievement, academic engagement, and academic competence. Affiliation with deviant close friends is expected to negatively relate to academic achievement, academic engagement, and academic competence. The interaction of academically oriented close friends is expected to be stronger in the context of risk, such that students' relationships with academically oriented close friends are expected to buffer the negative academic outcomes associated with relationships with deviant close friends. Specifically, across the transition into middle school, close friendships with academically oriented peers are expected to be positively related to improvements in achievement-related variables and will compensate for the negative consequences of close friendships with deviant peers. The current study will expand upon previous literature by examining an at-risk and diverse student sample, by simultaneously investigating the unique and joint contributions of academically oriented and deviant

close friends, and by looking at relationships with deviant close friends from a risk perspective. Examination of study variables in early adolescence and specifically across the transition into middle school will contribute to the literature base by providing a more complete understanding of the influence that friends have on learning across development.

CHAPTER II

METHODS

Participants

Participants are comprised of a subsample of 652 elementary and middle school students from a larger sample of 784 students participating in a longitudinal study on the impact of grade retention on academic achievement. Participants were originally recruited in first grade across two sequential cohorts in 2001 and 2002 and from three school districts in southeast and central Texas (1 urban and 2 small city). A total of 1,374 students were identified as eligible to participate in the study. Eligible students scored below the median score on a state approved district-administered measure of literacy in either May of Kindergarten or September of first grade, spoke English or Spanish, had not been previously retained in first grade, and were not receiving special education services. A total of 1,374 students were eligible. Because teachers distributed consent forms, we are not able to determine the number who actually received consent forms. Of these, 1,200 returned consent forms and 784 (65.3%) provided positive consent. Students with consent did not differ from students without consent on age, gender, ethnicity, eligibility for free or reduced lunch, bilingual class placement, or district-administered literacy test scores.

The current study includes a sample of 652 students (375 in cohort 1, 277 cohort 2) and uses data collected during the 5th and 6th years of the larger ongoing longitudinal study. Of the 784 students, 684 students were recruited to participate in the study were

active during year 5 and the school they were attending was known. Of these, 652 students had data on at least one study variable at time 5. The 652 active students with some data did not differ from the 132 initially recruited students on baseline or demographic variables (gender, ethnicity, economically disadvantaged status), cognitive intelligence as measured by the Universal Nonverbal Intelligence Test (UNIT, Bracken & McCallum, 1998), or bilingual class placement. For the 652 students, 8.63% of the data were missing. Because of the relatively small percentage of missing data and the equivalence of children with and without data on study and demographic variables, multiple imputation was used to impute missing data from the information available (Fichman & Cummings, 2003). Ten complete imputed data sets were created using SAS PROC MI (SAS Institute, 2004) with Markov Chain Monte Carlo (MCMC) method (Schafer, 1997). Sample statistics are reported for the first dataset for simplicity. The average estimates across the 10 data sets were used to increase stability of the parameter estimates of the hypothesized models.

Of the 652 participants in the study, 348 were male (53.4%), and the racial/ethnic composition was 38.8% Hispanic, 33.7% Caucasian, 23.3% African American, and 4.2% other. The students' mean age at the baseline of data collection (the 5th wave for cohorts 1 and 2) was 11.57 (SD = 0.38) and the grade placement of students was 66.7% in 5th grade, 31.9% in 4th grade, and 1.4% in 3rd grade. The students' mean intelligence as measured by the Universal Nonverbal Intelligence Test (UNIT; Bracken & McCallum, 1998) was 92.82 (SD=14.52). Based on family income, 63.1% were eligible to receive free or reduced lunch. For 86.8% of participants, the highest education level in the

household was high school completion or higher and for 75.4% of participants, at least one adult in the household was employed full time. Approximately 10.7% of students were enrolled in bilingual classrooms and 11.4% received special education services.

Measures

Academic achievement. The *Woodcock Johnson Tests of Achievement, Third Edition* (WJ-III; Woodcock, McGrew, & Mather, 2001) is a measure of academic achievement for individuals ages 2 through adulthood. Trained research assistants administered the *WJ-III* to participants individually following standardized procedures. For the purposes of the current study, WJ-III Broad Reading scores (Letter-Word Identification, Reading Fluency, Passage Comprehension subtests) and the WJ-III Broad Math scores (Calculations, Math Fluency, and Math Calculation Skills subtests) were used. The internal consistency reliability estimates for this age group ranges from 0.92 - 0.93 (Woodcock et al., 2001). Much research supports the reliability and construct validity of the *WJ-III* and its predecessor (Woodcock, & Johnson, 1989; Woodcock, et al.). Analyses were conducted using Woodcock Johnson W scores, which are ideal to measure change in achievement (McCrew, Werder, & Woodcock, 1991).

The *Batería III: Woodcock- Muñoz: Pruebas de Aprovechamiento* (Muñoz-Sandoval, Woodcock, McGrew, & Mather, 2005) is the parallel Spanish version of the *WJ-III*. Students who had ever been in bilingual classrooms or who had ever been identified by the schools as Limited English Proficient and Spanish speaking were administered the *Woodcock-Munoz Language Test* (Woodcock & Munoz-Sandoval, 1993) to determine the children's language proficiency in English and Spanish. Students

identified as Spanish-language dominant were administered the *Bateria III*, which yields W scores for Reading and Math that are comparable to those of the *WJ-III* (Muñoz-Sandoval, et al., 2005).

Peer affiliation. Students were individually interviewed and asked to name peers they spend time with outside of the classroom and then describe characteristics of the peers. Beginning with peers the students spend most time with, students named up to 8 peers and, for each peer named, answered questions describing peers' friendship status (close friend or "someone you just spend time with") and behavior in prosocial and antisocial areas. The questions were adapted from Mahoney and Stattin (2000) and Shann (2001). The interview included a total of 7 questions describing peers' behaviors, to which participants responded 'yes or 'no.' The measure included 3 items describing peer academic orientation (i.e., Does peer plan to go to college?; Does peer get along with teachers and other adults?; Is the peer doing well in school?) and 4 items describing peer deviancy (i.e., Does peer regularly smoke or chew tobacco?; Is _____ often out on the town at night (Often defined as at least twice a month); Has peer ever been caught by the police?; and Has the peer ever skipped school?)

A peer academic orientation composite score was created using students' responses on the 3 academic orientation items and represents the percentage of one's peers whose behavior is academically oriented. First, the percentage of friends performing each behavior was calculated for each academic orientation item for each student. Then, the peer academic orientation composite score was computed by finding the mean of these items.

A peer deviancy composite score was created using students' responses to the 4 peer deviancy items. A continuous composite score representing the percentage of deviant peers was not used because a small number of friends were reported as engaging in deviant behavior. Thus, peer deviancy was considered to be dichotomous variable and the items were scored in a dichotomous fashion. If one or more friends engaged in the deviant behavior, the item was scored as a 1. First, the peer deviancy items were recoded into dichotomous variables, which indicated if a student did or did not have a friend who performed each deviant behavior. Next, the sum of each of the 4 dichotomous peer deviancy items was computed with a range of 0 - 4. The peer deviancy sum score represents the number of deviant behaviors that are performed by at least one friend. The sum of the four deviancy items was skewed and 70.3% of friends were reported as not engaging in any of the four deviant behaviors. Thus, a dichotomous composite score was created. Finally, the peer deviancy composite score was created by recoding the peer deviancy sum score into a dichotomous variable that indicates if participants have at least one peer who partakes in at least one deviant activity. The peer deviancy composite score was scored as "1" if participants reported at least one friend engaging in at least one deviant act.

Academic competence. Students were asked to rate how competent they feel in academic subjects and how important the academic subjects were. The 24-item measure was administered to students individually and was an abbreviated form of the Competence Beliefs and Subjective Task values questionnaire (Wigfield, Eccles, Yoon, Harold, et al., 1997). Students rated how competent they felt in academic subjects on a

scale from 0 to 30 by pointing to a scale with anchors. The original 40-item Scale had internal consistency reliabilities ranging from 0.74 to 0.90 for competence beliefs and ranging from 0.61 to 0.92 for subjective task values. Beginning in 3rd grade, children's report of competence correlated moderately with parent and teacher reports of competence, which supports the belief that, with age, children's competence beliefs become more in line with the competence reported by teachers and peers (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield, et al.). The current study used only items measuring academic competence in the areas of reading and math and included 5 items measuring reading competence and 5 items measuring math competence. Identical items were administered for reading and math. Items from the area of math are "How good in math are you?," "If you were to list all the students in your class from the worst to the best in math where would you put yourself?," "Some kids are better in one subject than in another subject. For example, you might be better in sports than in reading. Compared to most of your other school subjects, how good are you in math?," "How well do you expect to do in math this year?," and "How good would you be at learning something new in math?." The internal consistency for these items for our sample was 0.79 in the area of math and 0.84 in the area of reading.

Academic engagement. Teachers were asked to describe students' engagement in the classroom during the spring of each academic year. Once students entered middle school and had multiple teachers, the students' language arts teacher completed the questionnaire. Teachers completed a 18 item Likert-type scale ranging from 1 (not at all true) to 4 (very true) by rating the extent they agreed each statement described each

student. Teachers received compensation for completing and returning questionnaires for each student. The items were adapted from the teachers' ratings of students' engagement (Skinner, Zimmer-Gembeck, & Connell, 1998) and the student rating of engagement (Skinner, et al.) and were rephrased to be from the teacher's perspective. The scale was comprised of 10 items measuring behavioral engagement, 4 items measuring interest, and 4 items measuring emotional engagement. Principal components EFA using varimax rotation was used to determine the items measuring behavioral engagement. The scale used in the current study consisted of the 11 items, which loaded on a behavioral engagement factor and measured effort, persistence, concentration, and interest. Example items are "This student tries very hard to do well in school", "When this student is in class, he/she participates in class discussion", and "This student just wants to learn only what he/she has to in school" (reverse scored), "This student only pays attention to things that interest him/her in class" (reverse scored). The internal consistency for the sample was .91 for the 11-item behavioral engagement scale.

CHAPTER III

RESULTS

Descriptive and correlational analyses are reported first to describe patterns of study variables. Next the results of the tests of the hypothesized effects are reported and are followed by results of tests for gender moderation on the hypothesized models.

Preliminary Analyses

The study variables were examined for normality and outliers. No outliers were identified, and the analysis variables did not have values that exceeded the recommended cutoff values of 2 for skewness and 7 for kurtosis (West, Finch, & Curran, 1995). During the first year of the study, an average of 23.5% (SD = 0.42) of participants had at least one close friend who engaged in at least one deviant behavior; this number increased to 25.9% (SD = 0.44) the following year. On average, across the three academic items 88.0% (SD = 0.19) of participants' close friends engaged in academically oriented behaviors during the first year of the study and 92.4% (SD = 0.15) of participants' close friends engaged in academically oriented behaviors during the second year of the study. Males (T1: M = 25.3%; T2: M = 30.5%) tended to have a greater number of close friends who engaged in at least one deviant behavior than females (T1: M = 21.4%; T2: M = 21.7%).

The within- and cross- time zero order correlations are shown in Table 1. The stability of the characteristics of one's friends was examined from the correlation between peer affiliation variables from one year to the next. Affiliation with

academically oriented close friends ($r = .16, p < .01$) and affiliation with deviant close friends ($r = .14, p < .01$) are mildly stable across school grades. The low cross year stability for these variables suggests that the characteristics of adolescents' friends changed across the transition into middle school. Students' reading ($r = .90, p < .01$) and math ($r = .83, p < .01$) achievement and academic engagement ($r = .60, p < .01$) were highly stable from one year to the next. Competence beliefs were found to be moderately stable across time (Reading: $r = .38, p < .01$; Math: $r = .43, p < .01$). As expected, there were positive within- and cross- time associations between affiliation with academically oriented close friends and the academic related outcome variables and negative within- and cross- time associations between affiliation with deviant close friends and the academic related outcome variables. Within time 1, affiliation with academically oriented close friends was positively and significantly associated with reading and math achievement and reading and math competence beliefs. Also within time 1, affiliation with deviant close friends was negatively and significantly associated with reading and math achievement, math competence beliefs, and academic engagement. Within time 2, once the majority of the participants were in middle school, affiliation with academically oriented close friends was positively and significantly correlated with academic engagement but not with the other outcomes, and affiliation with deviant close friends was negatively and significantly associated with math achievement, math competence beliefs, and academic engagement. Across years, affiliation with academically oriented close friends at time 1 was significantly and positively associated with reading and math achievement, math competence beliefs, and engagement at time 2. Affiliation with

deviant close friends at time 1 was significantly and negatively associated with reading and math achievement, math competence beliefs, and engagement at time 2. The relationships between the peer affiliation (academic orientation x deviancy) interaction term and outcome variables were examined. In no case was the zero-order correlation between the interaction term and outcomes statistically significant. Therefore, the interaction term was dropped in tests of the hypothesized model.

The relationship between covariate variables (economic status and cognitive ability), gender, ethnicity, and the predictor and outcome variables were examined. Results are shown in Table 2. At times 1 and 2, economic status was negatively and significantly associated with the affiliation with academically oriented close friends and was positively and significantly associated with affiliation with deviant close friends. This finding suggests that students with a greater percentage of close friends who engaged in academically oriented behaviors were associated with being from a higher economic status while students with a greater number of close friends who engaged in at least one deviant behavior were associated with being from a lower economic status. Cognitive ability was positively and significantly associated with the affiliation with academically oriented close friends at time 1, which suggests students with higher cognitive ability tended to affiliate with a greater percentage of friends who engaged in academically oriented behaviors. The opposite was found for affiliation with deviant friends. Cognitive ability was negatively and significantly associated with affiliation with deviant close friends. Gender was positively and significantly associated with

affiliation with deviant close friends at time 2, which indicates that being male was associated with a high probability of associating with a deviant close friend.

Structural Equation Modeling Results (Tests of Hypothesized Model)

Analyses were conducted in Mplus (v.3.13, Muthén & Muthén, 2004) to adjust for the effects of clustering. Structural equation analyses were conducted using the “type = complex” cluster feature in Mplus to control for the nested structure of the data (i.e. the dependency among students within schools) by adjusting the standard errors of the estimated coefficients. The maximum likelihood estimation method with robust standard errors was used to estimate the hypothesized models (MLR; Muthén & Muthén, 2004). The models were estimated using the “type = imputation” feature of Mplus which yields more stable estimates by reporting the average parameter estimates and standard errors across the ten datasets. Model fit was examined using the model chi-square test and fit indices such as CFI, RMSEA, and SRMR, as well as modifications to improve model fit, which are supported by theory.

The measurement model of each latent variable was first examined. Poor model fit of each measurement model (achievement and competence beliefs) suggests reading and math are not indicators of a common latent trait of achievement, nor are reading and math competence beliefs indicators of a common latent trait of competence beliefs. Because of this, latent variables of achievement or competence beliefs were not used to test the hypothesized models. Separate models were examined for each outcome variable (reading achievement, math achievement, engagement, reading competence beliefs, math competence beliefs).

The hypothesized model (see Figure 1) posits a unique effect of change in time 2 peer affiliation variables (academic orientation and deviancy) on time 2 academic related outcome variables (reading achievement, math achievement, engagement, reading competence beliefs, math competence beliefs), while controlling for the effect of the previous score (T1) on the outcome (academic related variables) and covariates (economic status and cognitive intelligence).

Multi-group analyses were used to determine if gender moderates the relationship between peer affiliation and academically- related variables. Due to the use of a robust estimator, the Satorra-Bentler adjusted Chi-square difference test (Satorra, 2000) was adopted to examine the possible group differences on the hypothesized paths.

Academic engagement. Initially, the fit of the model was adequate [$\chi^2(13) = 54.594, p < .001$; CFI = .889; RMSEA = .070; SRMR = .043]. Modification indices suggested the addition of a path between the residuals of peer affiliation academic orientation time 2 and peer affiliation deviancy time 2 would improve model fit. The modification was added because it was consistent with theory and did not affect the paths of interest (Bentler, 2000, September 2). This modification also was added to each of the models examining the academic related outcome variables. The modified model is shown in Figure 2.

The fit of the modified model was good [$\chi^2(12) = 28.088, p = .005$; CFI = .957; RMSEA = .044; SRMR = .031]. The hypothesized structural paths from time 2 peer affiliation to time 2 engagement were not significant, although the path from deviant peer affiliation at time 2 to engagement at time 2 approached significance ($\hat{\gamma}_{\text{standardized}} = -$

0.054, p (one-tail) = .08). Table 3 reports results of model paths. Significant stability paths were found from time 1 variables to time 2 variables (Peer Affiliation Academic Orientation: $\hat{\gamma}_{\text{standardized}} = 0.144$, p (one-tail) = .01, Peer Affiliation Deviancy: $\hat{\gamma}_{\text{standardized}} = 0.093$, p (one-tail) = .007, Engagement: $\hat{\gamma}_{\text{standardized}} = 0.566$, p (one-tail) < .001). The model explained 38.3% of the variance in time 2 engagement.

To test for gender moderation of the hypothesized stability and structural paths, each of the stability and structural, hypothesized paths were constrained to be equal across males and females. The constrained and unconstrained models examining engagement differed in fit ($\chi^2_{\text{diff}}(7) = 89.350$, $p < .001$), indicating that males and females differed in the stability of peer affiliation and the relationship between peer affiliation and academic engagement. These findings suggest the characteristics of one's friends may be more stable across the transition into middle school for females than males.

Because constraining each of the stability and structural paths to be equal across males and females indicated gender differences existed in the overall engagement model, each path was examined individually to determine where significant differences occurred. When each of the stability and structural hypothesized paths were examined individually, the path from peer affiliation academically oriented time 2 to academic engagement time 2 differed significantly for males and females ($\chi^2_{\text{diff}}(1) = 9.780$, $p = .002$). The path was not significant in the male or female model, although the value of the path was greater for males. The results indicate the size of the significant paths in the overall engagement model did not differ significantly across gender groups.

Reading achievement. The fit of the model was good [$\chi^2(12) = 35.006, p < .001$; CFI = .981; RMSEA = .054; SRMR = .030], the hypothesized paths from time 2 peer affiliation to time 2 reading achievement were not significant. Significant longitudinal paths were found from time 1 variables to time 2 variables (Peer Affiliation Academic Orientation: $\hat{\gamma}_{\text{standardized}} = 0.144, p(\text{one-tail}) = .01$, Peer Affiliation Deviancy: $\hat{\gamma}_{\text{standardized}} = 0.093, p(\text{one-tail}) = .007$, Reading Achievement: $\hat{\gamma}_{\text{standardized}} = 0.869, p(\text{one-tail}) < .001$). The model explained 81.5% of the variance in time 2 reading achievement. Multi group analyses found that the stability and structural paths did not differ for males and females in the model predicting reading achievement.

Math achievement. Although the fit of the model was good [$\chi^2(12) = 24.788, p = .016$; CFI = .987; RMSEA = .039; SRMR = .030], the hypothesized paths from time 2 peer affiliation to time 2 math achievement were not significant, although the path from deviant peer affiliation at time 2 to engagement at time 2 approached significance ($\hat{\gamma}_{\text{standardized}} = -0.032, p(\text{one-tail}) = .09$). Significant longitudinal paths were found from time 1 variables to time 2 variables (Peer Affiliation Academic Orientation: $\hat{\gamma}_{\text{standardized}} = 0.144, p(\text{one-tail}) = .01$, Peer Affiliation Deviancy: $\hat{\gamma}_{\text{standardized}} = 0.093, p(\text{one-tail}) = .007$, Math Achievement: $\hat{\gamma}_{\text{standardized}} = 0.776, p(\text{one-tail}) < .001$). The model explained 69.5% of the variance in time 2 math achievement.

Gender moderation was examined in the overall model examining math achievement. The model constraining each of the hypothesized stability and structural paths and the unconstrained model examining math achievement differed in fit ($\chi^2_{\text{diff}}(7)$

=13.462, $p = .06$), indicating that gender may moderate the stability of peer affiliation and the relationship between peer affiliation and math achievement. The characteristics of one's friends may be more stable across the transition into middle school for females than males.

Next, each of the hypothesized stability and structural paths in the math achievement model were examined individually to identify group differences. When the stability and structural paths were examined individually, gender differences were not found, although a difference in the path from peer affiliation deviancy time 2 to math achievement time 2 approached significance ($\chi^2_{\text{diff}}(1) = 2.925, p = .087$). In the male model, the negative path from peer affiliation deviancy time 2 to math achievement time 2 was significant ($\hat{\gamma}_{\text{standardized}} = -0.006, p(\text{one-tail}) = .022$).

Math competence beliefs. Although the fit of the model was good [$\chi^2(12) = 28.714, p = .004$; CFI = .913; RMSEA = .045; SRMR = .030], the hypothesized paths from time 2 peer affiliation to time 2 math competence beliefs were not significant. Significant stability paths were found from T1 variables to T2 variables (Peer Affiliation Academic Orientation: $\hat{\gamma}_{\text{standardized}} = 0.144, p(\text{one-tail}) = .01$, Peer Affiliation Deviancy: $\hat{\gamma}_{\text{standardized}} = 0.093, p(\text{one-tail}) = .007$, Math Competence Beliefs: $\hat{\gamma}_{\text{standardized}} = 0.417, p(\text{one-tail}) < .001$). The model explained 19.3% of the variance in time 2 math competence beliefs. Multi group analyses found that the stability and structural paths did not differ for males and females in the model predicting math competence beliefs.

Reading competence beliefs. The fit of the model was marginal [$\chi^2(12) = 39.701, p < .001$; CFI = .853; RMSEA = .059; SRMR = .032]. Modification indices suggested

model fit would be improved with the addition of a path between the residuals peer affiliation deviancy time 1 and peer affiliation deviancy time 2. This modification is supported by theory so the path was added. The fit of the modified model was good [$\chi^2(11) = 22.834, p = .019$; CFI = .937; RMSEA = .040; SRMR = .024], the hypothesized paths from time 2 peer affiliation to time 2 reading competence beliefs were not significant. Significant longitudinal paths were found from time 1 variables to time 2 variables (Peer Affiliation Academic Orientation: $\hat{\gamma}_{\text{standardized}} = 0.163, p(\text{one-tail}) = .005$, Peer Affiliation Deviancy: $\hat{\gamma}_{\text{standardized}} = 1.013, p(\text{one-tail}) = .005$, Reading Competence Beliefs: $\hat{\gamma}_{\text{standardized}} = 0.384, p(\text{one-tail}) < .001$). The model explained 15% of the variance in time 2 reading competence beliefs. Multi group analyses found that the stability and structural paths did not differ for males and females in the model predicting reading competence beliefs.

CHAPTER IV

CONCLUSIONS AND DISCUSSION

The study examined the relationship between peer affiliation and academic variables during a period of relative instability in early adolescents' lives, the transition into middle school. Affiliation with academically oriented close friends was associated positively with academic variables and affiliation with deviant close friends was associated negatively with academic variables. Support of this relationship was found in the expected direction, but change in peer affiliation did not predict changes in the academic related outcomes in the models examined, although the relationship between affiliation with deviant close friends and academic outcomes approached significance in the models examining math achievement, engagement, and math competence beliefs, such that greater affiliation with deviant close friends predicted decreases in math achievement, engagement, and math competence beliefs,. These results are contrary to previous research, which has documented that affiliation with academically oriented close friends increases students' achievement (Stewart, 2008), and partially support research which has found that affiliation with deviant close friends decreases students' achievement (Veronneau, et al., 2008). Additionally, affiliation with academically-oriented close friends was not found to moderate the relationship between affiliation with deviant close friends and academic variables.

The results of the current study extend upon work that examined peer affiliation and academic variables, and is one of the first to examine the joint impact of affiliation

with academically oriented and deviant friends on academic variables. The current study measured students' academic achievement using a standardized measure of achievement rather than classroom grades. A standardized measure of achievement may have greater stability and be subject to less variance over time because classroom grades are more influenced by differences in schools and teachers and individual differences in student motivation, effort, and study habits (Marsh, Trautwein, Ludke, Koller, & Baumert, 2005). The study also expanded upon previous literature by examining the association between peer affiliation and academic related variables within a large sample composed of at-risk and racially diverse youth.

As was expected, affiliation with academically oriented close friends was positively associated with the academic outcome variables and affiliation with deviant close friends was negatively associated with the academic outcome variables. Interestingly, the pattern of associations between the peer affiliation and academic variables differed in each year examined. Affiliation with academically oriented close friends was positively associated with reading and math achievement, and reading and math competence beliefs only at time 1, and was positively associated with engagement only at time 2. Affiliation with deviant close friends was negatively associated with reading achievement at time 1 only and was negatively associated with reading and math achievement, and math competence beliefs at both time 1 and time 2. Although within-time correlations were significant, the longitudinal hypotheses were not fully supported because a significant relationship between change in peer affiliation and change in the academic related outcome variables was not found. Affiliation with academically

oriented close friends was not found to moderate the relationship between affiliation with deviant peers and academic related variables. It is important to note that failure to find significant effects are unlikely due to power issues. Based on the fact that the results were in the expected direction but not statistically significant, it is likely that the hypothesized effects are small and not detectable with the measure used in the current study.

Failure to find the expected longitudinal effects may be due to one or more factors. First, the low stability in peer affiliation patterns across the two years suggests that friendships are changing rapidly during this period. Perhaps close friendships are changing so rapidly that a relationship between close friend affiliation at any one point is not predictive of one's engagement, competence beliefs, or achievement. Benner and Graham (2009) suggest the transition is a developmental process, which should be examined as a more broad developmental context, rather than a single point in time. The examination of peer relationships and academic competencies across a longer period of time may allow for differences in the developmental trajectory of students to be identified. Because friendships may be changing too rapidly to impact academic outcomes, more frequent assessment of affiliation with close friends may be needed to determine if students' typical level of affiliation with academically oriented or deviant friends predicts academic outcomes across the middle school years. Also, the academic outcome variables may be too stable for an effect of peer affiliation to be detected across a one year period of time.

Consistent with previous literature, stability of affiliation with academically oriented close friends, affiliation with deviant close friends, reading achievement, math achievement, reading competence beliefs, math competence beliefs, and academic engagement over time was supported by identifying significant stability paths in the overall model. These findings are similar to previous research, which has found friendships to be moderately stable over time (Pellegrini & Bartini, 2000). When examining the overall models for math achievement and academic engagement, the autoregressive, or stability, paths for affiliation with academically orientated and deviant friends were significant across the transition into middle school for females but was not significant for males. This finding supports the literature base, which suggests that characteristics of friendship tend to be more consistent over time for females than for males. Specifically, during the transition into middle school, females have a greater number of reciprocated friends, are more satisfied with their friendships, receive more emotional support and positive feedback from their friends than males (Cantin, & Boivin, 2004; Pellegrini & Bartini, 2000). Also, immediately following the transition into middle school only, females reported greater friendship quality than males (Kingery & Erdley, 2007).

When examining the overall model, gender was found to moderate the relationship between peer affiliation variables, and engagement and math achievement. Differences for males and females were not found when the significant structural paths were examined individually in the model examining engagement. The gender difference in the area of math found in the study is consistent with previous research. In a study

examining the peer context of adolescents' math experiences in school, Crosnoe, Riegle-Crumb, Field, Frank, and Muller (2008) found that patterns of students being academically oriented toward math in high school were more consistent for females than for males. On average, high school males took lower level math courses than females, failed more math coursework than females, and had friends and classmates who made lower grades in math than females. In support of hypothesis 2, a marginally significant gender difference was identified when structural paths were examined individually, such that affiliation with deviant peers at time 2, which was the first year of middle school for the majority of the sample, predicted lower math achievement in the same year for males only. Similarly, previous research has found the transition to middle school to be associated with decreases in math achievement for students exposed to greater levels of risk (Burchinal, Roberts, Zeisel, & Rowley, 2008). The findings of the current study are consistent with this work, as males who were exposed to greater levels of risk, i.e., greater affiliation with deviant peers, exhibited lower math achievement.

Limitations and Future Research

The findings of the study should be interpreted in light of limitations of the study. First, the sample examined in the study is comprised of low achieving students and does not represent students across the entire range of achievement. Participants were selected if they scored below the median score on a state approved district-administered measure of literacy in either May of Kindergarten or September of first grade. Previous research has shown differential pattern of achievement and competence for high and low achieving students when they affiliate with high versus low achieving friends (Altermatt

& Pomerantz, 2005; Marsh & Parker, 1984). Low achieving students reported lower competence when they affiliated with high achieving peers than when they affiliated with low achieving peers, while achievement level of one's peers was not associated with self-reported competence for high achieving students (Altermatt & Pomerantz). Students with low literacy skills early in school may develop relationships with friends with differing characteristics and these relationships may affect academic outcomes differently than for students with high literacy skills.

Several limitations of the study relate to the sensitivity of measurement and the ability of the measures used to examine changes in peer affiliation and academic outcomes. A greater number of items measuring affiliation with academically oriented and deviant friends may allow for more accurate measurement of the variables. Also, there is the possibility of self-report bias, but the measures performed as expected and similar methods are commonly used in the field. Few participants in the study had at least one close friend who engaged in at least one deviant behavior (Time 1: 23.5%, Time 2: 25.9%). Specifically, at time 2, the percentage of study participants who had at least one close friend who engaged in each of the deviant items are as follows: skip school 10%, smoke tobacco regularly 1%, on the town at night 17%, and in trouble with the police 6%. The low level of deviancy found in the study was consistent with the prevalence of current cigarette use (6.3%) reported by sixth grade students in the *2005 Middle School Youth Behavior Risk Survey* (Shanklin, Brener, McManus, Kinchen, & Kann, 2007). The measure of close friends' deviancy used in the study was not sensitive enough to measure the presence of more moderate forms of deviancy. Future research

would benefit from measuring More mild precursors of deviancy have higher rates of prevalence reported by sixth grade students in the *2005 Middle School Youth Behavior Risk Survey*, such as been in a physical fight (56.5%), carried a weapon (33.2%), lifetime cigarette use (19.9%), and lifetime alcohol abuse (26.2%) (Shanklin, et al., 2007).

Also, the measure of students' affiliation with academically oriented close friends used in the study may not have been sensitive enough to measure differences among close friends' academically oriented behaviors. Such a large proportion of participants' close friends displayed academically oriented behaviors (T1 = 88.0%, T2 = 92.4%) indicates there was little variation in the behaviors of participants' close friends. The *Search Institute Profiles of Student Life: Attitudes and Behaviors* survey reports that 63% of students in the United States in grades six through twelve have best friends who are a positive influence (Search Institute, 2003). The same survey reported greater variation in the prevalence of students' academic orientation than the current study: 65% are motivated to achieve well in school, 55% are actively engaged in learning activities, 52% feel a positive bond to their school, 47% complete at least one hour of homework each day, and 22% reading for pleasure at least three hours each week (Search Institute, 2003). Future research may benefit from including academically oriented behaviors that are less prevalent across the middle school student population and that would provide greater variation in participant response.

Previous research has shown close friends have the greatest influence on students' achievement, but has suggested that the broader group of students' peers and classmates also play a significant role in students' academic outcomes (Crosnoe, Riegle-

Crumb, Field, Frank, & Muller, 2008)). Future studies may benefit from examining influence of broader peer group and the peer network, as well as the impact of close friends on academic outcomes.

The study examines students in early adolescence, a time when many developmental changes take place. The transition from elementary school and into middle school marks a time of even greater turbulence in students' lives. A major limitation to the current study is that all participants did not make the transition into middle school from time 1 to time 2 in the study. The grade level in which students transition into middle school differs across districts and some students included in the study had been retained in grade during the elementary grades. In order to better understand the impact that the affiliation with friends has on academic outcomes during a period of flux, all students included in the sample should make the transition into middle school. Future research should include a measurement of transition status to ensure all participants at time one complete the final year of elementary school and all participants at time 2 have entered the first year of middle school. Also, future research may benefit from taking a more refined approach to measurement of the changes in peer affiliation and academic outcomes over time, such as using latent class analysis to examine between individual differences in slopes for the peer affiliation variables.

Due to the great amount of change and lack of stability that exists in adolescents' lives around the transition into middle school, evaluation of a one-year period of students' lives may not have allowed for the pattern of relationships between peer affiliation and academic outcomes to become apparent. A greater understanding of the

pattern of relationships may also be attained if peer affiliation and academic outcomes are measured at more than one time each year, as research has shown initial increases in students' peer network size immediately following the transition to middle school to decrease over time (Cantin & Boivin, 2004). More frequent examination of these relationships across a longer period of time, beginning in elementary school and continuing across the middle school years, may allow for there to be a greater understanding of the relationships between changes in the developmental trajectories for peer affiliation and academic motivation and achievement that occur in adolescents' lives.

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APPENDIX A

Table 1

Within-time and cross-time zero-order correlations, means, and standard deviations of study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Read Ach T2	1.00													
2. Math Ach T2	<i>.690</i>	1.00												
3. CBM T2	<i>.063</i>	<i>.284</i>	1.00											
4. CBR T2	<i>.311</i>	<i>.124</i>	<i>.241</i>	1.00										
5. TENG T2	<i>.356</i>	<i>.409</i>	<i>.206</i>	<i>.113</i>	1.00									
6. PA AC T2	<i>.049</i>	<i>.031</i>	<i>.032</i>	<i>.015</i>	<i>.140</i>	1.00								
7. PA D T2	<i>-.057</i>	<i>-.105</i>	<i>-.099*</i>	<i>-.002</i>	<i>-.160</i>	<i>-.205</i>	1.00							
8. Read Ach T1	<i>.899</i>	<i>.640</i>	<i>.073</i>	<i>.293</i>	<i>.332</i>	<i>.051</i>	<i>-.040</i>	1.00						
9. Math Ach T1	<i>.639</i>	<i>.830</i>	<i>.240</i>	<i>.085*</i>	<i>.368</i>	<i>.007</i>	<i>-.087*</i>	<i>.631</i>	1.00					
10. CBM T1	<i>.049</i>	<i>.203</i>	<i>.430</i>	<i>.058</i>	<i>.089*</i>	<i>.038</i>	<i>.004</i>	<i>.062</i>	<i>.256</i>	1.00				
11. CBR T1	<i>.254</i>	<i>.094*</i>	<i>.115</i>	<i>.380</i>	<i>.108</i>	<i>.071</i>	<i>.084*</i>	<i>.283</i>	<i>.099*</i>	<i>.275</i>	1.00			
12. TENG T1	<i>.246</i>	<i>.283</i>	<i>.177</i>	<i>.128</i>	<i>.600</i>	<i>.050</i>	<i>-.079*</i>	<i>.244</i>	<i>.297</i>	<i>.156</i>	<i>.065</i>	1.00		
13. PA AC T1	<i>.122</i>	<i>.152</i>	<i>.130</i>	<i>-.015</i>	<i>.098*</i>	<i>.158</i>	<i>-.080*</i>	<i>.172</i>	<i>.163</i>	<i>.193</i>	<i>.197</i>	<i>.077</i>	1.00	
14. PA D T1	<i>-.091*</i>	<i>-.143</i>	<i>-.105</i>	<i>-.006</i>	<i>-.102</i>	<i>-.110</i>	<i>.137*</i>	<i>-.116</i>	<i>-.147</i>	<i>.081*</i>	<i>-.027</i>	<i>-.158</i>	<i>-.123</i>	1.00
<i>M</i>	507.21	510.73	21.89	21.00	2.76	.90	.25	498.52	504.32	22.25	21.33	2.77	.87	.24
<i>SD</i>	20.99	10.93	5.09	5.24	.67	.17	.43	18.92	10.59	5.86	5.54	.70	.19	.42

Note: $N = 652$. T2 = Time 2; Read Ach = Reading achievement; Math Ach = Math achievement; CBM = Math competence beliefs; CBR = Reading competence beliefs; TENG = Teacher rated academic engagement; PA AC = Affiliation with academically oriented close friends; PA D = Affiliation with deviant close friends; T1 = Time 1. $p < .01$ are represented in italics. * $p < .05$.

Table 2

Zero-order correlations of the covariate and moderating variables with predictor and outcome variables.

	15. Econ	16. Hisp	17. AfAm	18. Cauc	19. Oth	20. Gender	21. IQ
1. Read Ach T2	-.351*	-.016	-.317*	.270*	.072	-.084**	.280*
2. Math Ach T2	-.300*	-.013	-.318*	.255*	.101*	.044	.378*
3. CBM T2	.028	-.076	.080**	-.003	.022	.009	.123*
4. CBR T2	-.012	-.056	.080**	.001	-.035	-.008	-.007
5. TENG T2	-.179*	.010	-.179*	.137*	.030	-.197*	.119*
6. PA AC T2	-.080*	.008	-.067	.022	.072	-.077	.004
7. PA D T2	.148*	.052	.000	-.067	.033	.099**	-.077**
8. Read Ach T1	-.300*	.032	-.344*	.245*	.070	-.066	.284*
9. Math Ach T1	-.278*	-.023	-.291*	.237*	.113*	.043	.346*
10. CBM T1	.049	.003	-.018	.031	-.042	.093**	.120*
11. CBR T1	-.041	.012	.051	-.068	.022	-.013	-.015
12. TENG T1	-.077**	.109*	-.212*	.086**	-.021	-.217*	.160*
13. PA AC T1	-.089**	-.043	-.056	.078**	.040	-.018	.092**
14. PA D T1	.132*	.094**	.003	-.066	-.079**	.046	-.067
16. Hisp	.349*	1.00					
17. AfAm	.257*	-.439*	1.00				
18. Cauc	-.495*	-.568*	-.393*	1.00			
19. Oth	-.224*	-.166*	-.115*	-.148*	1.00		
20. Gender	.023	-.013	-.023	.030	.009	1.00	
21. IQ	-.212*	.067	-.278*	.160*	.046	.051	1.00

Note: Econ = Economic status; IQ = Intellectual ability. Ethnicity Contrasts: Hisp = Hispanic v. Not Hispanic; AfAm = Black v. Not Black; Cauc = White v. Not White; Oth = Asian, Pacific Islander, Native America v. Not. T2 = Time 2; Read Ach = Reading achievement; Math Ach = Math achievement; CBM = Math competence beliefs; CBR = Reading competence beliefs; TENG = Teacher rated academic engagement; PA AC = Affiliation with academically oriented close friends; PA D = Affiliation with deviant close friends; T1 = Time 1. * $p < .01$. ** $p < .05$.

Table 3

Standardized structural equation model results.

Path	Outcome Variable									
	Reading Achievement		Math Achievement		Engagement		Math Competence Beliefs		Reading Competence Beliefs	
	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
Out1 → Out2	.869	>.001	.776	>.001	.566	>.001	.417	>.001	.384	>.001
Econ → Out2	-.085	>.001	-.053	.045	-.119	.004	.024	.279	-.013	.375
IQ → Out2	.010	.303	.098	>.001	.009	.409	.077	.051	.012	.379
Gender → Out2	-.035	.032	.001	.45	-.090	.011	-.019	.330	.019	.151
PA AC1 → PA AC2	.144	.010	.144	.010	.144	.010	.144	.010	.163	.005
PA D1 → PA D2	.093	.007	.093	.007	.093	.007	.093	.007	1.013	.005
PA AC2 → Out2	.000	.492	.013	.276	.036	.193	.011	.373	.013	.373
PA D2 → Out2	-.005	.401	-.032	.092	-.054	.083	-.064	.065	.003	.471

Note: *N* = 652. *p* (one tail). Coef. = Coefficient; Out1 = Outcome variable at Time 1; Out2 = Outcome variable at Time 2; Econ = Economic status; IQ = Intellectual ability; PA AC1 = Affiliation with academically oriented close friends at time 1; PA AC2 = Affiliation with academically oriented close friends at time 2; PA D1 = Affiliation with deviant close friends at time 1; PA D2 = Affiliation with deviant close friends at time 2.

APPENDIX B

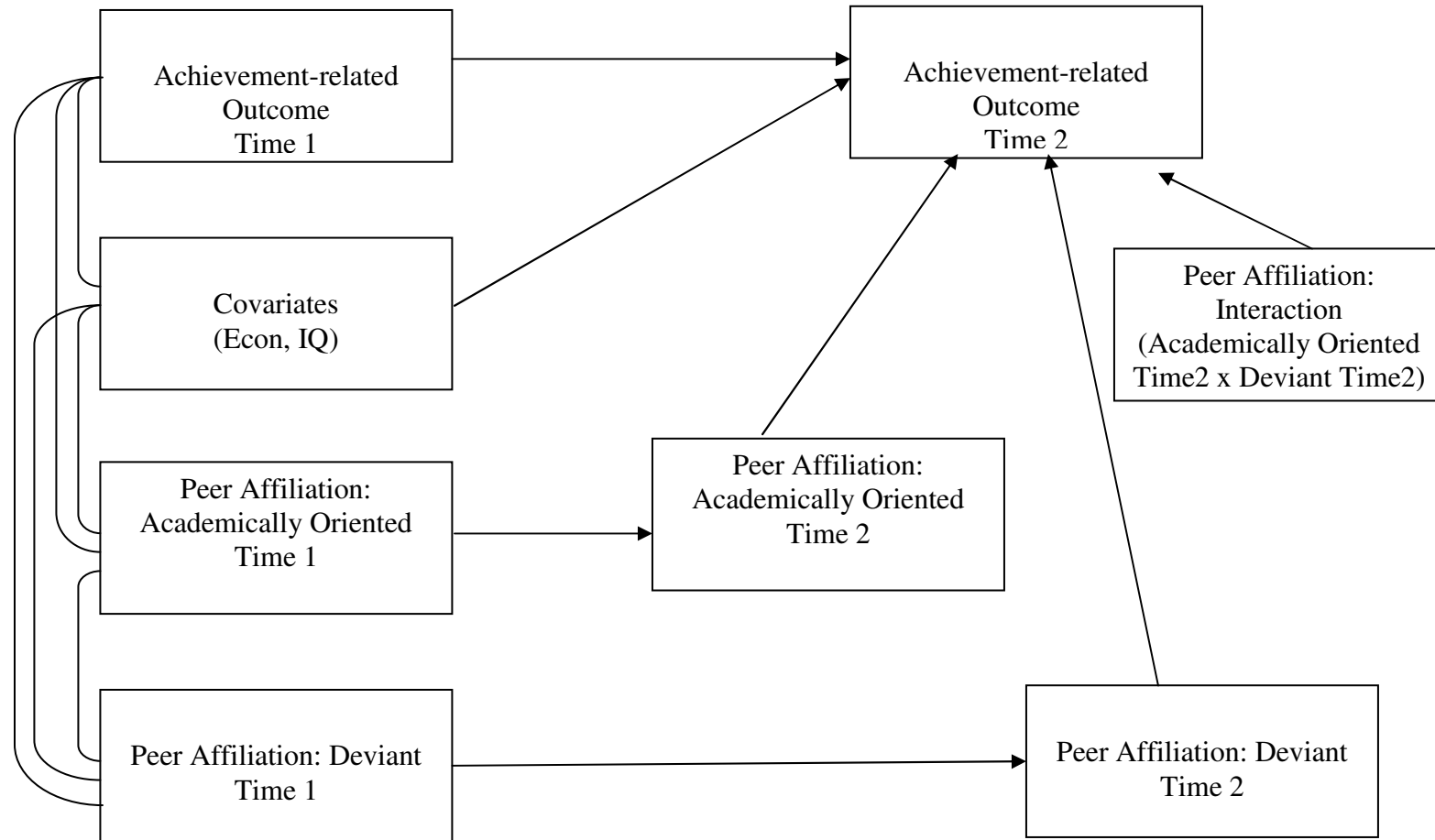


Figure 1. Hypothesized path model.

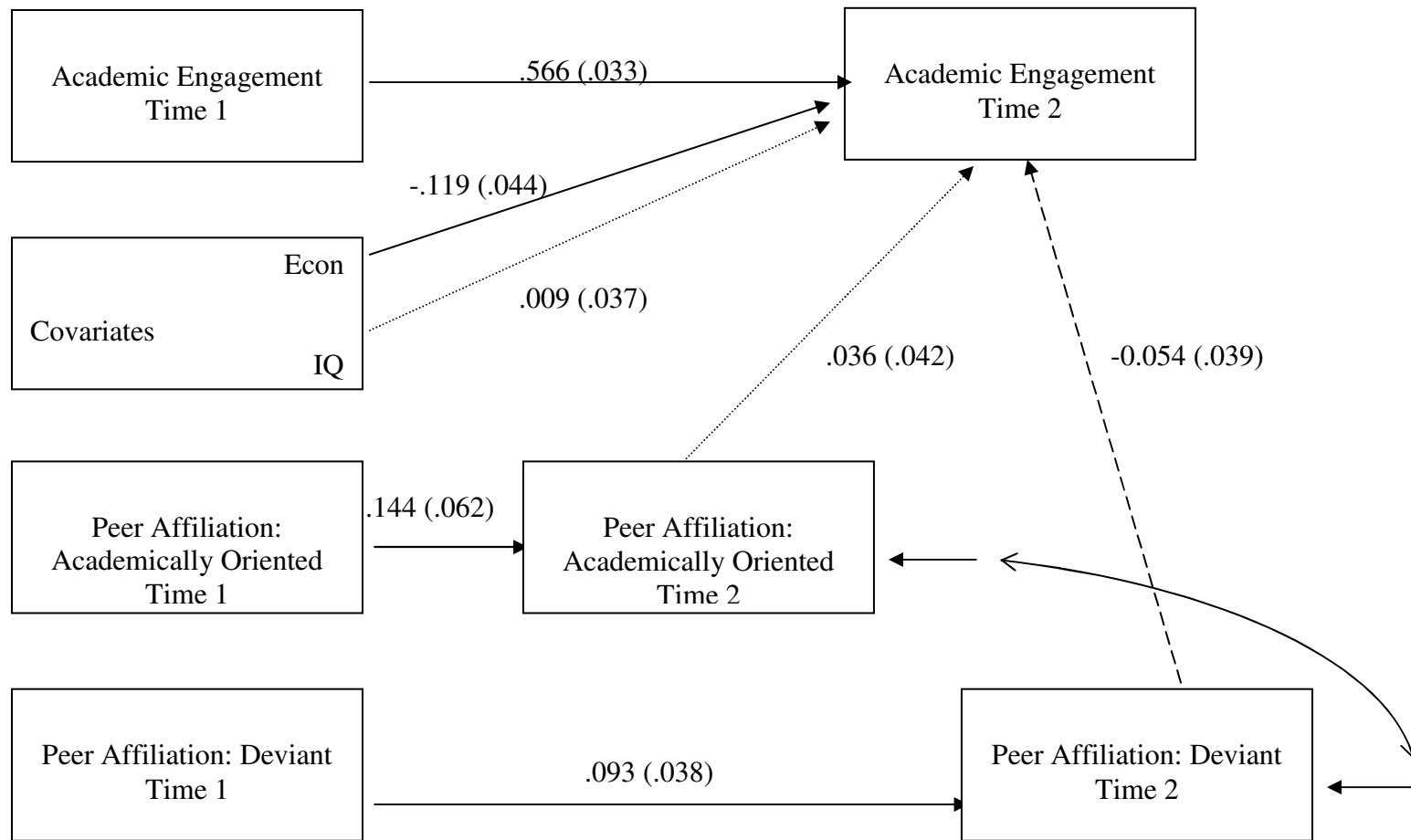


Figure 2. Modified path model of academic engagement. *Note.* All paths are standardized and all coefficients are averaged across 10 imputed data sets. Standard errors are shown in parentheses. All coefficients are significant ($p < .05$), except dashed paths ($p < .10$), and dotted paths ($p > .10$). Paths between exogenous variables are not drawn for simplicity, see table 1 for correlation coefficients.

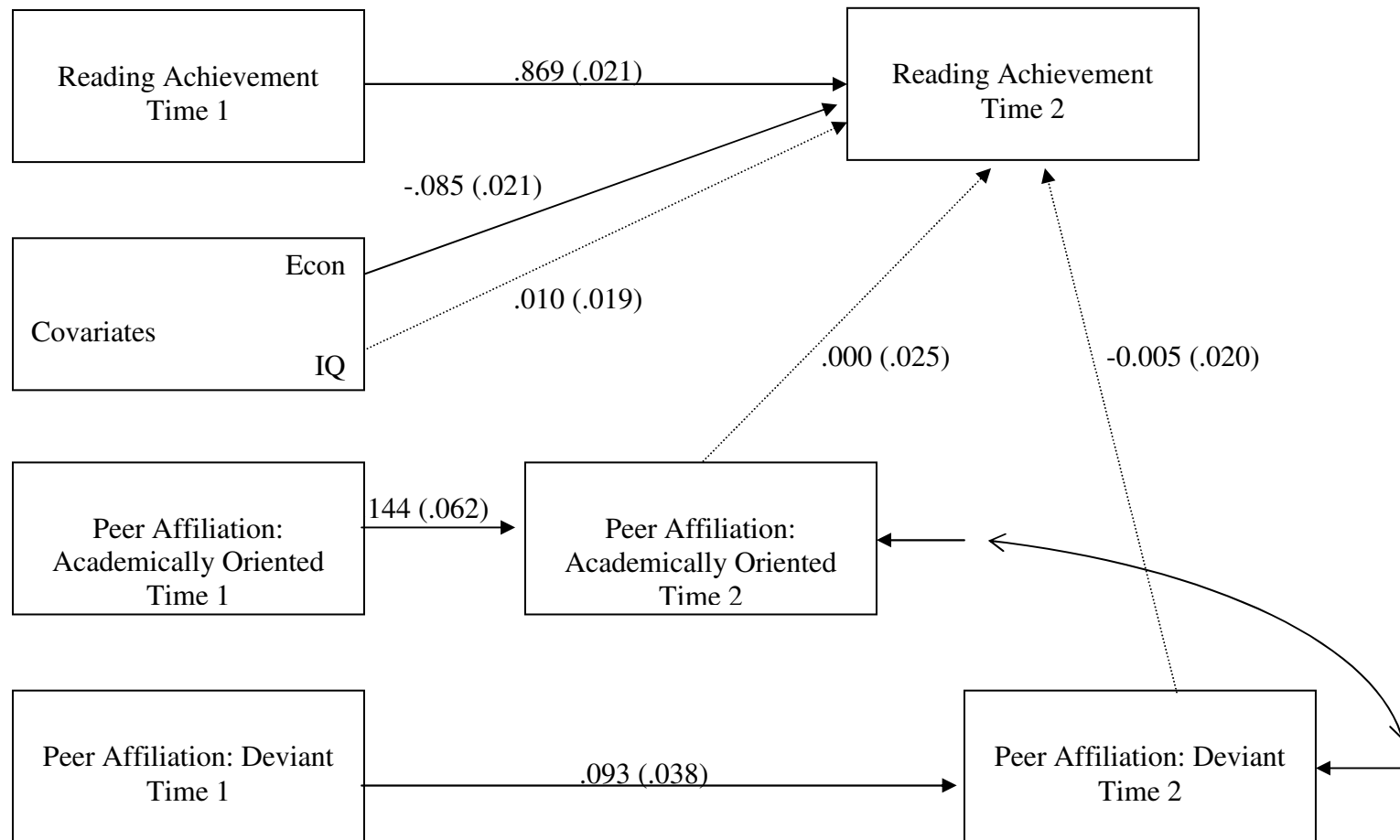


Figure 3. Modified path model of reading achievement. *Note.* All paths are standardized and all coefficients are averaged across 10 imputed data sets. Standard errors are shown in parentheses. All coefficients are significant ($p < .05$), except dashed paths ($p < .10$), and dotted paths ($p > .10$). Paths between exogenous variables are not drawn for simplicity, see table 1 for correlation coefficients.

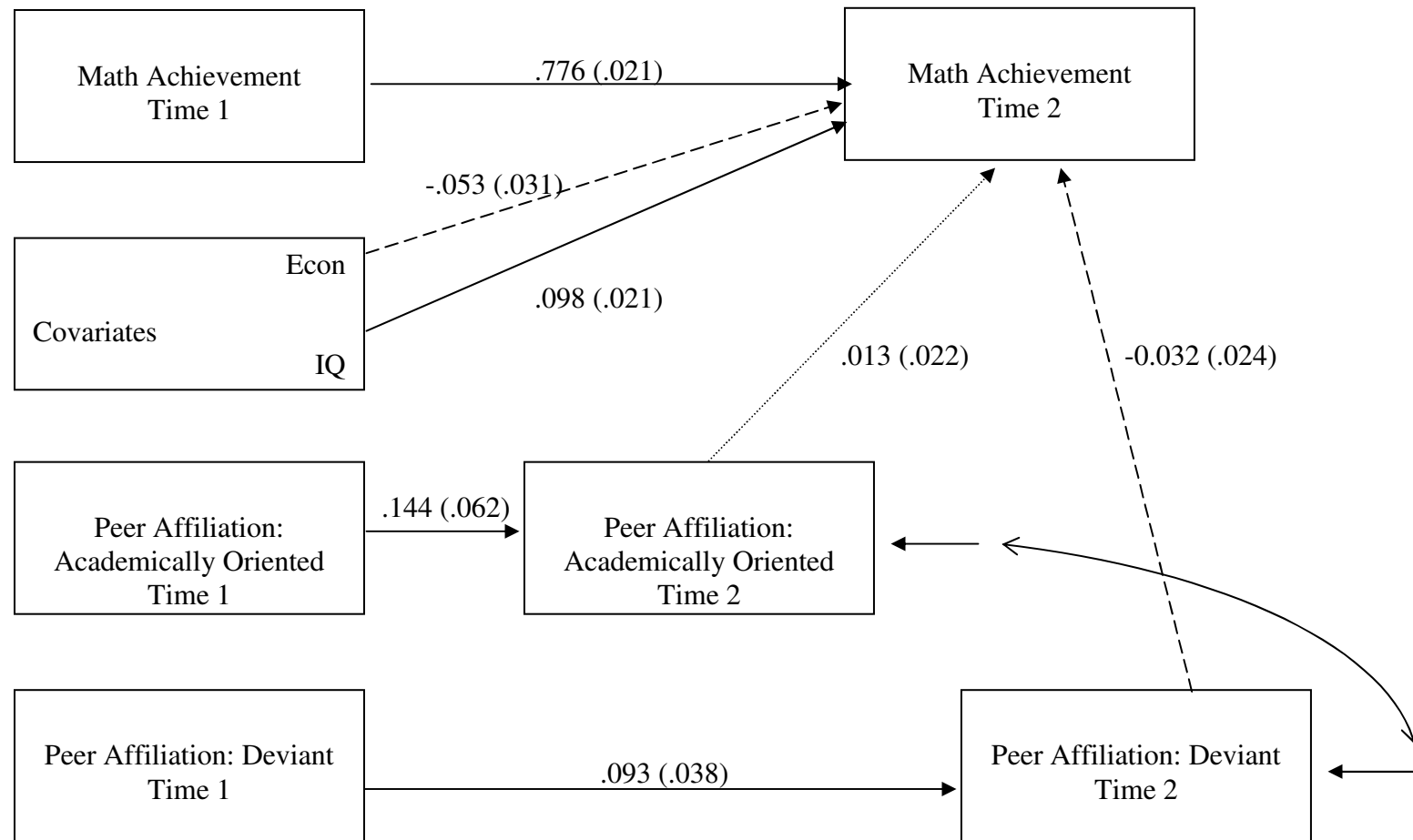


Figure 4. Modified path model of math achievement. *Note.* All paths are standardized and all coefficients are averaged across 10 imputed data sets. Standard errors are shown in parentheses. All coefficients are significant ($p < .05$), except dashed paths ($p < .10$), and dotted paths ($p > .10$). Paths between exogenous variables are not drawn for simplicity, see table1 for correlation coefficients.

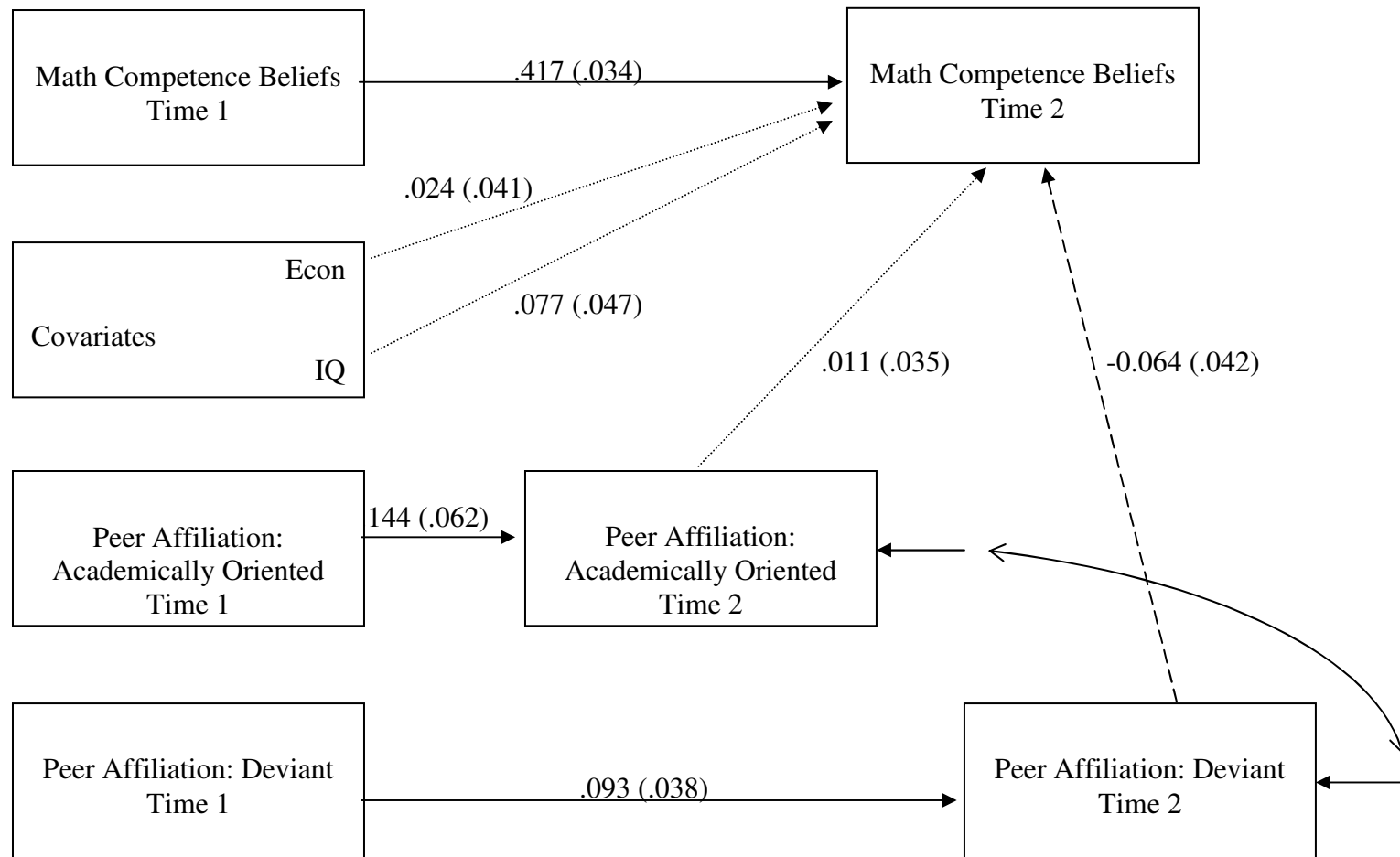


Figure 5. Modified path model of math competence beliefs. *Note.* All paths are standardized and all coefficients are averaged across 10 imputed data sets. Standard errors are shown in parentheses. All coefficients are significant ($p < .05$), except dashed paths ($p < .10$), and dotted paths ($p > .10$). Paths between exogenous variables are not drawn for simplicity, see table 1 for correlation coefficients.

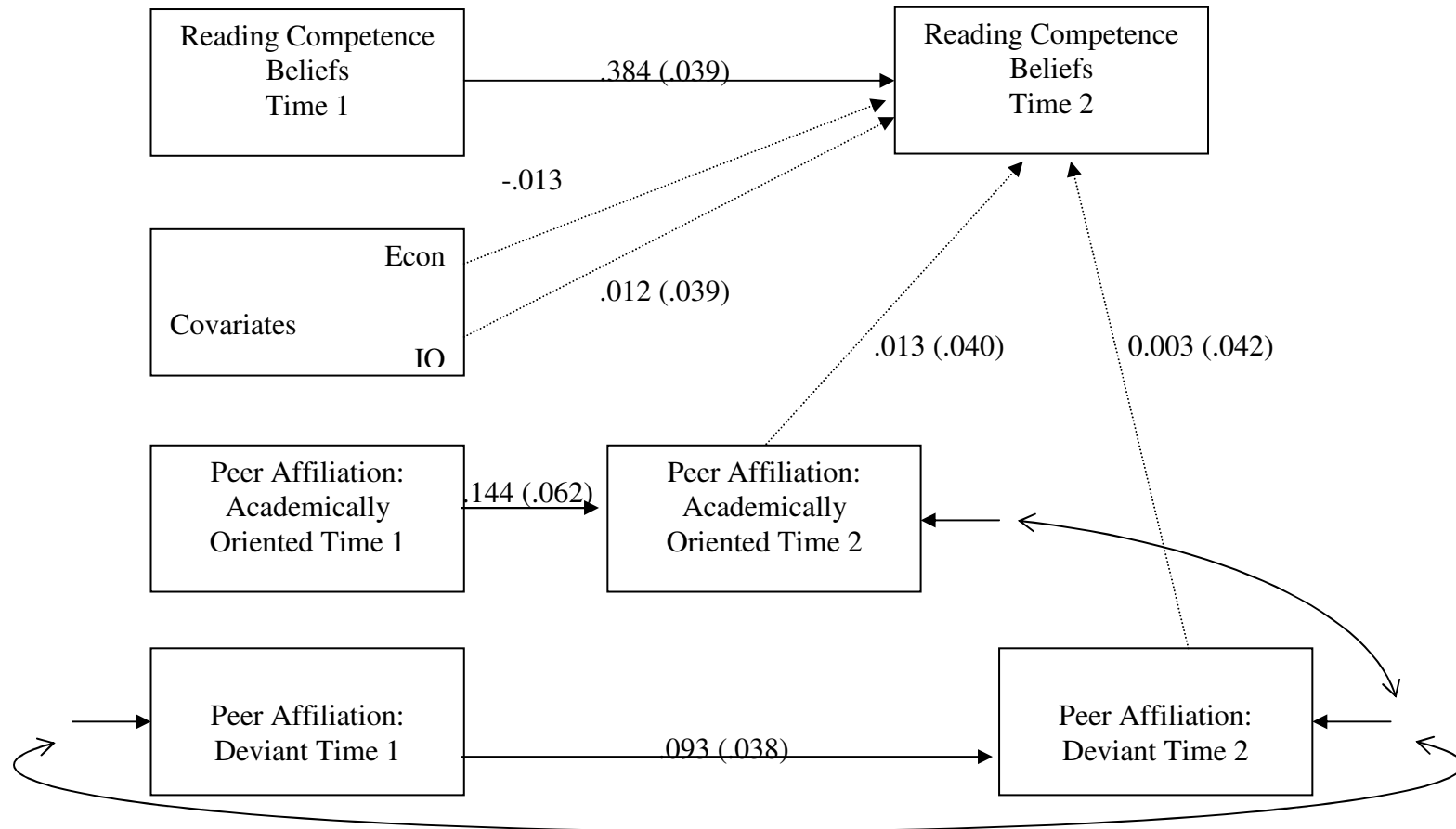


Figure 6. Modified path model of reading competence beliefs. *Note.* All paths are standardized and all coefficients are averaged across 10 imputed data sets. Standard errors are shown in parentheses. All coefficients are significant ($p < .05$), except dashed paths ($p < .10$), and dotted paths ($p > .10$). Paths between exogenous variables are not drawn for simplicity, see table1 for correlation coefficients.

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